

...since
1975

The company FAS (Flüssiggas-Anlagen GmbH, Salzgitter) was established in 1975 as commercial enterprise for LPG equipment (propane/butane). At the end of the seventies the "safety idea" gained more and more acceptance for customers and users. Due to the legal rules and regulations FAS extended the product range "safety engineering" and included a large number of further valves, fittings and equipment into the delivery program in order to comply with the increased requirements in safety engineering of gas producers, suppliers and distributors.

Over the years new products were developed and constructed by FAS for market niches in order to be able to fulfil the increasing wishes and requirements of the customers. For this reason it was also necessary to change and to extend the production area in Salzgitter a few times so that now in the new location in Salzgitter, Peiner Straße 217 the possibility to come up to the actual market situation is given and realized.

FAS modern and large-scale production facilities with a service workshop and is able to produce all innovative FAS-products in highest possible quality and in a reliable manner under observation of the delivery dates. The products developed by FAS are manufactured on most modern machines by highly qualified and efficient experts and are subject to a very extensive quality securing system.

Due to the far-sighted and successful company politics FAS purposefully developed to one of the most competitive and efficient suppliers of LPG fittings and equipment for road tankers and stationary installations within Europe.

The company may fall back upon one of the best assorted and largest stock of equipments of any kind destined for all industrial LPG applications within Europe. With more than 10.000 of different articles on stock, FAS has one of the widest assortments of this branch world-wide. In the meantime FAS is represented on almost all important markets within Europe by its own sister companies, by local sales consultants or agencies.

It is our permanent endeavour to develop our products and to keep the high-quality standard so that we will be able to achieve to competitive advantage together with our customers also in future.

What is LPG?

LPG consists of hydrocarbon and it will be won from forwarding of gas as well as crude oil refining. LPG is well known under the name of Propane/Butane.

Released Energy in the narrowest area

Under the relative small excess pressure the gases will be liquefied and will be provided in cylinders or in tanks. In this way large Energy quantities of gas will be made ready for shipment and for stocking space saved. For comparison: when vaporizing LPG is extending up to 250-fold of its volume. By the way, 2001 the whole demand in Europe was supplied with more than 60% from the gas fields directly and only with more than 40% from refineries.

Clean and sure in the practise

During the removing from the pressure tank LPG will go over from its liquid phase in the gas phase and arrives across regulators- and safety equipment to the consumer plant. LPG burns cleanly, it is non-poisonous and here with one of the latest form of Energy. Beginning from the forwarding up to the customer there are neither conversion loses nor pollutant emission in the closed system. Because of its cleanliness LPG can be used in the water protection areas.



Liquid Gas for industrial application

In the industrial and commercial areas liquid petroleum gas will be common used for heating of the halls as well as process gas for various applications. As it requires very often to get large quantities of liquid gas during the shortest time (wherefore the capacity of vaporizing process only of the tank is not enough as a rule), liquid gas vaporizers are used for such supplying constructions, which carry over the liquid gas from its liquid phase in the gas phase.

Vaporizing capacities (natural Vaporizing) overground tanks

Content of the tank, kg	For annual consumption, kg	Short time unloading, kg/h (summer/winter)	Periodical unloading, kg/h (summer/winter)	Permanent unloading, kg/h (summer/winter)
800	1600	22,5/4,5	13/2,5	10,0/2,0
1200	2400	35,0/7,0	14/3,0	11,0/2,2
2000	4000	65,0/13,0	25/5,0	18,0/3,5
4000	8000	107,5/21,5	45/9,0	30,0/6,0
5000	10000	155,0/31,0	67/13,5	36,0/7,0
5600	12000	170,0/34,0	72/14,5	38,0/7,5
7500	15000	200,0/40,0	80/16,0	42,0/8,5

Vaporizing capacities (natural Vaporizing) underground tanks

Content of tank, kg	For annual consumption, kg	Short time unloading, kg/h	Periodical unloading, kg/h	Permanent unloading, kg/h
800	1600	15,0	6,0	6,0
1200	2400	42,5	8,0	6,5
2000	4000	75,0	15,0	11,5
4000	8000	100,0	20,0	15,5
5000	10000	125,0	26,0	18,0
5600	12000	215,0	43,0	23,0
7500	15000	255,0	48,0	25,0

Vaporizing technique



FAS-2000

Electrically heated

- 32 kg/h
- 60 kg/h
- 100 kg/h
- 170 kg/h

FAS-3000

Hot water heated

- 200 kg/h
- 300 kg/h
- 1200 kg/h
- 1900 kg/h
- 3000 kg/h
- 7000 kg/h
- 14000 kg/h



Certified according to the Pressure Equipment Directive 97/23/EG and to the ISO 9000:2000

FAS 20000

indirectly electrically heated vaporizer

Single vaporizer



The FAS-dry vaporizers are completely maintenance-free and require no heat transfer fluid. An aluminium core is used as the heat transferring medium, in which the heating equipment and vaporizer system are cast.

Using a thermostat, the heat transferring medium is heated and monitored within the limits specified by DIN standards. Once the required vaporizer temperature has been reached, the solenoid valves open. Liquid gas enter the vaporizer where it is converted to vapour without any fluctuations in pressure until the specified rated capacity has been reached.

The modern design means that fluctuations in vapour flow are detected immediately and the required heating capacity is adjusted quickly to suit the new operation parameters. In case of power failure or overload, the solenoid valves close. An additional safety limit switch monitors the outlet temperature of the vapour and prevents it from exceeding the given limit.



Complete cabinet unit

Liquid gas vaporizers FAS 2000 can be delivered with one required capacity in two versions: as a single vaporizer and as a complete cabinet unit. Single vaporizer consists of one vaporizer ready for connection and can be used as an additional element in the existing units.

One complete cabinet unit is executed in a cabinet and is equipped with all necessary components such as shut off valve, control valve, safety equipment. This unit can be equipped in accordance to the particular specification of the object with all necessary regulators or regulator units with suitable for energy generator outlet pressure.

Standard execution of regulator has outlet pressure of 1,5 bar (middle pressure) up to 36 mbar (low pressure). For safety and depending on equipment version of regulator vaporizer can be equipped with emergency shut off valve and/or relief valve, which will be adjusted at the outlet pressure of the unit and tested directly before the shipment.



FAS 2000 complete vaporizer unit — capacity table



Vaporizer Type	Capacity, kg/hour	Voltage	Dimensions, mm	Output pressure, mbar
FAS 2000-32/220	32	230 V/50 Hz	1200×800×400	50–300
FAS 2000-32	32	400 V/50 Hz	1200×1200×400	
FAS 2000-60	60		1600×1200×500	
FAS 2000-100	100		1600×1200×600	
FAS 2000-170	170		2400×2000×600	
FAS 2000-330	330			
FAS 2000-450	450			



**Complete Vaporizer unit FAS 2000
with outlet pressure 50 mbar**

Complete vaporizer unit FAS 2000 for 32 kg/h is available in two versions: 400 V and 230 V.

1. Vaporizer FAS 2000
2. Liquid trap
3. Regulator unit — Pre-stage $P_a=1,5$ bar
4. Regulator unit — $P_a=50$ mBar
5. Electrical switch box
6. Solenoid valve
7. Fine mesh filter
8. Shut off valve

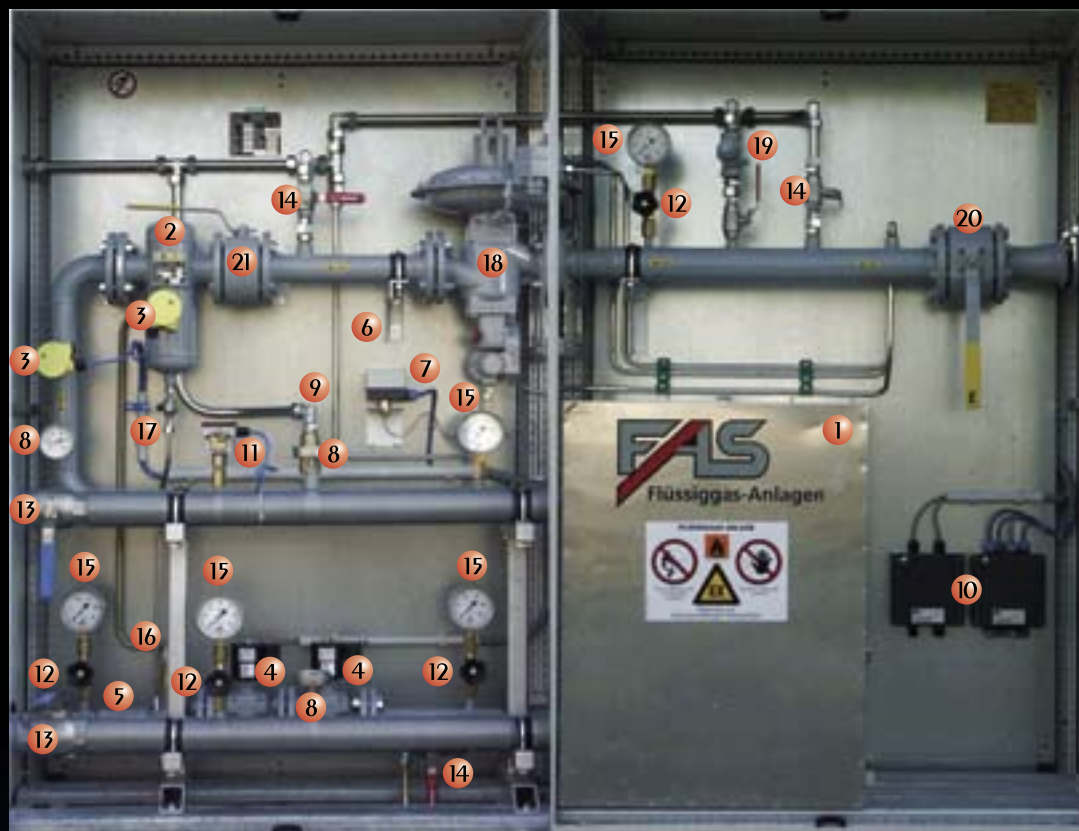
FAS 30000

hot water heated
vaporizer unit

**FAS 3000 complete vaporizer unit —
capacity table**

FAS catalogue number	Capacity, kg/hour	Outlet pressure, mbar
20 247	400–800	without regulator unit
20 246	1000–1200	
20 245	1500–1900	
20 229	up 4000	
20 249	up 7000	
20 250	up 12 000	
20 248	400–800	20–2100
20 2481	400–800	5–5000
93 065	1000–1200	
93 073	1500–1900	
93 153	up 4000	
93 074	up 7000	
03 075	up 14000	





Complete hot water vaporizer unit FAS 3000 (capacity – 1200 kg/hour)

1. Hot water vaporizer FAS 3000
2. Liquid gas trap
3. Liquid level sensor
4. Solenoid valve
5. Fine mesh filter
6. Thermoement
7. Double temperature controller
8. Thermometer
9. Safety relief valve
10. Terminal box
11. Pressure sensor
12. Pressure gauge – shut off valve
13. Ball valve
14. Ball valve
15. Pressure gauge
16. Safety relief valve
17. Ball valve
18. Pressure regulator
19. Pressure retaining valve
20. Ball valve
21. Ball valve
22. Pressure gauge



Example of installation of vaporizer cabinet units

Propane-air technology



FAS 4000 HP

propane-air mixing unit

Mixing units FAS 4000 HP will be executed in two versions and can be built with each capacity accordingly to the require of the customer.

Normally difficulties of the systems, which will be operated with natural gas, are unexpected loos of pressure in the system, production of water condensate in the pipe line — these all is leading to a perforce production interruption as well as to great risks of industrial looses.

To enable efficient leading of liquid gas into the system, without any stoppage of the unit, such mixing units as FAS 4000 will be used.

When should be installed a mixing unit?

- *As a gas reserve maintenance in the natural gas lines;*
- *Activation of full, exchange, amendment, compensation, change-over and basic maintenance with gas;*
- *In the new or already existing LPG-pipe net-works with a higher condensate risk.*

Mixing units produce one liquid gas-air-mixture with a constant capacity and quality, which will be used as an exchange for natural gas for the maintenance.



Mixing units FAS 4000 will be executed in two versions:

- as a low pressure unit — LP;
- as a high pressure unit — HP.

Low pressure units will be normally produced for systems with outlet pressure not higher as 500 mbar and they will be executed as a cabinet version.

High pressure units with automatical regulation of calorific value of the whole gas-air-mixture are generally speaking more complicated and will be produced depending on operation conditions.

FAS 4000 complete mixing unit — capacity table

Type of mixing unit	Capacity, m ³ (Propane/Air mixture) kg/hour	Inlet/Outlet LPG	Inlet/ Outlet pressure, mbar
FAS 4000-32 ND	30/30	DN15/DN50	2000-5000/bis 500
FAS 4000-60 ND	50/60	DN15/DN50	2000-5000/bis 500
FAS 4000-100 ND	80/100	DN20/DN65	2000-5000/bis 500
FAS 4000-160 ND	130/160	DN25/DN65	2000-5000/bis 500
FAS 4000-300 ND	240/300	DN25/DN65	2000-5000/bis 500



